Cardiorespiratory physiotherapy as a career choice – Perspective of students and physiotherapists in Portugal

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ABSTRACT

We investigated Portuguese physiotherapy students' and physiotherapists' 1) perceptions of Cardiorespiratory Physiotherapy (CRP); 2) factors that influenced their decision to pursue a career in CRP and 3) suggestions to develop CRP.

Online surveys were disseminated through final year students and physiotherapists.

189 students [mean age 23 (SD 6) yrs; 78% ♀] and 375 physiotherapists [mean age 31 (SD 8) yrs; 78% ♀] participated. Students' opinions about CRP were positively influenced by lecturers (n=112, 69%), clinical experiences (n=110, 68%) and scientific evidence (n=93, 57%). Only 13% of students were "extremely interested" in specialising in CRP. Interest in the area and clinical exposure were the main factors influencing students to pursue a career in CRP. 15% of responding physiotherapists were working in CRP. Their decision to pursue a CRP career was most influenced by their interest in the area (n=37, 67%) and opportunity to work in acute settings (n=31; 56%). Main suggestions to develop CRP were: i) include placements in CRP; ii) emphasise health promotion within the curriculum; iii) develop CRP skills in broader contexts and training.

Strategies focusing on changing the curriculum, increasing exposure to CRP, providing good mentorship, developing health promotion activities and creating postgraduate courses may increase the attractiveness for CRP.

Keywords. Physical Therapy Specialty, Physical Therapists, Physical Therapy Students

INTRODUCTION

Noncommunicable diseases (NCD), such as cardiovascular diseases, chronic respiratory diseases, diabetes and cancer, are lifestyle-related diseases currently responsible for 40 million deaths/year, equivalent to 70% of all deaths globally (World Health Organization, 2017). The United Nations and the World Health Organization have targeted a reduction of one-third of premature mortality due to NCD by 2030 and are currently considering the prevention and treatment of these conditions a worldwide priority (World Health Organization, 2017). Cardiorespiratory physiotherapists work in a variety of sectors and settings within the health systems (e.g., such as hospitals, rehabilitation centres, community health centres, private practice and academic environments) to improve quality of life and physical fitness, maximise function, educate and promote healthy lifestyles (Australian Physiotherapy Association, 2017). Therefore, these professionals work with a wide range of health conditions that impact on the cardiac, respiratory, vascular and metabolic systems (Dean et al., 2011; Dean et al., 2014; World Health Organization, 2013), and their effectiveness in preventing and managing NCDs is well established (Dean et al., 2011; Dean et al., 2014; World Confederation for Physical Therapy, 2013; World Health Organization, 2013). Despite the burden of these conditions and the wide scope of cardiorespiratory physiotherapy (CRP) practice, physiotherapy students have been showing more interest in other areas of physiotherapy, such as musculoskeletal or sports (Janaudis-Ferreira et al., 2016; Mulcahy, Jones, Strauss, & Cooper, 2010; Öhman, Solomon, & Finch, 2002; Öhman, Stenlund, & Lars, 2001; Reeve, Skinner, Lee, Wilson, & Alison, 2012).

The students' lack of interest by the CRP area has been raising concern within international physiotherapy societies (Dean et al., 2014; Limb, 2009), as it may lead to

few specialised cardiorespiratory physiotherapists. CRP is one of the main non-invasive and cost-effective practices with a labor pattern consistent with the needs of effective health education delivery and implementation (Dean et al., 2011; Dean et al., 2014). Thus, having few professionals in this area may affect the prevention and treatment options offered to patients and families with NCD. Nevertheless, few studies have been conducted to comprehensively understand the reasons for choosing or not CRP.

Previous studies have shown that the main factors influencing students not to specialise in CRP were their experiences; academic and clinical role models/mentorships (Janaudis-Ferreira et al., 2016; Reeve, Skinner, Lee, Wilson, & Alison, 2012; Roskell & Cross, 2003); opportunities for postgraduate studies, employment (Reeve, Skinner, Lee, Wilson, & Alison, 2012); and perception of low levels of competency (Roskell & Cross, 2003). Nevertheless, representative samples were never included which impairs the generalisation of the results found. Additionally, physiotherapists are the fifth largest health profession and the primary non-invasive health profession with primary responsibility in targeting NCD (Dean et al., 2011; Dean et al., 2014). Yet, the perspectives of these professionals on CRP remain unknown.

Therefore, this study sought to explore Portuguese final year physiotherapy students' and physiotherapists' 1) perceptions of CRP in comparison with other areas of physiotherapists' specialisation; 2) factors that influenced their decision to pursue or not a career in CRP and 3) suggestions to guide the direction of further development of the CRP specialty. By having representative perspectives of students and professionals, we will be improving our current understanding of physiotherapy education and practice and supporting the advance of national and international guidelines for the

development and implementation of CRP towards what needs to be modified, why and how.

METHODS

Study design and ethics

This was a cross-sectional online survey conducted in a joint collaboration between the School of Health Sciences, University of Aveiro, Portugal and the Department of Physical Therapy, University of Toronto, Canada. Ethical approval was obtained from an independent Health Sciences Research Unit Ethical Committee (ref. P223-09/2014).

Participants

Physiotherapy students and physiotherapists were invited to participate. Students were considered eligible if they were final year physiotherapy students, in an attempt to guarantee that they had already experienced patients with cardiorespiratory conditions. Physiotherapists were included if they had a degree in physiotherapy and were working in Portugal. Students and physiotherapists were excluded if they did not digitally consent to participate or closed the questionnaire without submitting the answers.

Recruitment

A modified Dillman's approach was used for the recruitment (Dillman, Smyth, & Christian, 2014). All 18 institutions (public or private) offering undergraduate physiotherapy programmes in Portugal and the Portuguese Association of Physiotherapists were contacted. After obtaining the consent from the institutions, detailed information about the study and two *LimeSurvey* hyperlinks (i.e., one survey

directed to physiotherapy students and the other directed to physiotherapists) were sent via email. A request to disseminate the links across the contacts of each person was included in the e-mail. Institutions were asked to disseminate the study and surveys by their students and professional contacts (e.g., lectures, clinical mentors/supervisors and services). Two follow-up emails were sent two and three months after the initial contact, acknowledging students and physiotherapists for completing the questionnaire or reminding them to do so.

Sample size calculation

A sample size calculation for surveys, based on Bartlett, Kotrlik, and Higgins (2001), was determined to ensure representativeness of the population surveyed. A sample size estimate with 5% error and an alpha level of 0.05 was calculated considering a population of all national final year physiotherapy students (n≈600) and physiotherapists (n=10.000). Thus, a minimum sample size of 187 students and of 264 physiotherapists was established.

Data collection

A questionnaire developed by Reeve, Skinner, Lee, Wilson, and Alison (2012) was used as a model to facilitate comparisons with previous studies (Janaudis-Ferreira et al., 2016; Reeve, Skinner, Lee, Wilson, & Alison, 2012). The questionnaire was slightly adjusted during a pilot testing conducted in two sessions, one with 8 physiotherapy students and another one with 8 physiotherapists. Each session started by sending the hyperlink to the participants and giving them time to complete the questionnaire. At the end, a focus group was conducted with each group. An independent researcher with experience in leading focus groups facilitated both sessions. The questions required participants to

provide feedback on presentation, design, structure and organisation of the survey; clarity, adequacy and comprehensiveness of the questions; and suggestions for improvement. Focus groups lasted between 60 to 90 minutes and were audio-recorded and transcribed verbatim. After piloting, minor changes regarding the formatting, organisation and cultural expression adaptations of the questionnaires were performed. Data from piloting were not included in this study.

A final version of both questionnaires was reached, where the first page provided general information about the study. Digital consent was obtained by clicking on the "agree" box in the second page of the survey.

The students' survey was divided into six sections (Reeve, Skinner, Lee, Wilson, & Alison, 2012): 1) general data; 2) clinical placement information; 3) physiotherapy career intentions; 4) interest or not in CRP specialisation; 5) opinions of CRP and 6) general questions and suggestions. The physiotherapists' survey was divided into the following four sections: 1) general data; 2) physiotherapists working in the cardiorespiratory area, 3) physiotherapists not working in the cardiorespiratory area and 4) general questions and suggestions. Most questions were of a closed or categorical nature, using 5-point Likert scales, but offering participants an opportunity to comment openly where appropriate.

Data analysis and response rates

Data were exported from *LimeSurvey* to Excel and then to Statistical Package for Social Sciences (SPSS) version 22 for statistical analysis.

Closed questions were analysed and presented using descriptive statistics. A systematic approach to the analysis of the open questions was used and common themes, concerns

and suggestions were identified following a methodology previously used by others (Reeve, Skinner, Lee, Wilson, & Alison, 2012). These questions were summarised by one researcher and double-checked by a second researcher.

A total of 210 physiotherapy students from the 18 institutions (35% response rate) and 545 physiotherapists (14% response rate) responded to the survey. Twenty-one physiotherapy students consented but submitted the survey without responses and therefore, 189 questionnaires were considered for analyses. Forty-four physiotherapists did not digitally consent, and 126 consented but submitted the survey without responses and therefore, 375 questionnaires were included in the analyses.

Most questionnaires presented missing data, unevenly distributed along participants. Thus, to avoid unnecessary loss of information, incomplete questionnaires were not discharged, but results were reported considering the total valid answers for each question (e.g., if 144 students reported having had at least one CRP placement, but only 186 out of the total 189 students answered this particular question, then the result would be reported as “n=144, 77%” since 144/186=0,774). Subgroup analyses comparing male and female responses from students and physiotherapists, and urban (>5000 inhabitants) and non-urban (i.e., rural and semi-urban, ≤5000 inhabitants) responses from physiotherapists only (since all institutions providing the physiotherapy degree to students are based in urban areas), were also conducted using the Chi-squared association test for nominal data, the Chi-squared Mantel-Haenszel linear by linear association test for ordinal data and the t-test for continuous data.

RESULTS

General data of physiotherapy students and physiotherapists

Table 1 shows the general characteristics of physiotherapy students [mean age 23 (SD 6) years old; 147 ♀ (78%)] and physiotherapists [mean age 31 (SD 8) years old; 292 ♀ (78%)].

(please insert table 1 about here)

Physiotherapy students

Clinical placement information

Most physiotherapy students (n=144, 77%) reported having had at least one CRP placement before completing the survey, mostly in the third (n=82, 58%) and fourth (n=60, 42%) years of the undergraduate programme. CRP placements occurred in outpatient rehabilitation (n=75, 52%), medical (n=56, 39%), intensive care units (n=49, 34%) and surgical (n=49, 34%) settings. Generally, students acknowledged an increase in their CRP knowledge (n=129, 90%) and an enjoyable experience (n=116, 81%) with their CRP placements. Within other placements, 63 (34%) students reported having had treated patients with cardiorespiratory conditions however, these represented a small percentage (< 15%) of their caseload (n=45; 71%).

Sixty-six (36%) students reported having previously requested a CRP clinical placement. Among the remaining students, most clinical placements requested were in musculoskeletal (n=58, 51%) and neurology (n=36; 32%).

Physiotherapy career intentions

Prior to commencing their physiotherapy undergraduate programme, only 62 (34%) students knew that physiotherapists treated patients with cardiorespiratory conditions and only 41 (22%) knew what they wanted to work in [34 specified their preference: 16 (39%) musculoskeletal, 11 (27%) sports, 3 (7%) paediatrics, 2 (5%) neurology, 1 (2%) oncology and 1 (2%) CRP].

One hundred and ten (60%) students reported to be definitely interested in specialising in any area of physiotherapy, while 68 (37%) were still undecided and 4 (2%) showed no interest in specialising. Those interested in specialising reported that they would consider specialising after two to five years of experience (n=74; 68%), immediately following graduation (n=25; 23%) or after five years of experience (n=19; 9%).

The largest proportion of students were “extremely interested” in specialising in musculoskeletal physiotherapy (n=59; 33%). The CRP area was the second least popular with only 23 (13%) students being “extremely interested” and 32 (18%) reporting “no interest at all” in specialising (figure 1).

(please insert figure 1 about here)

The factors that most positively influenced the choice of their area of preference were interesting aspects of the area (n=176; 97%), clinical exposure (n=164; 91%) and job accessibility (n=111; 61%) (Figure 2).

(please insert figure 2 about here)

Interest or not in cardiorespiratory physiotherapy specialisation

Students who responded that they were at least a little interested in specialising in CRP (n=150; 82%) reported that the factors that most positively influenced their interest were “interesting aspects about CRP” (n=110; 80%) and “clinical exposure/experience” (n=99; 72%). Factors reported to have had no influence in their interest were “influence of others” (n=97; 71%) and potential salary (n=94; 69%) (Figure 3).

(please insert figure 3 about here)

Most students would like to work in CRP in paediatrics (n=25, 19%), private practice (n=24, 18%) or intensive care units (n=20, 15%) as first choice (Figure 4). The least preferred settings were research (n=4, 3%) and teaching (n=2, 2%).

(please insert figure 4 about here)

Opinions of cardiorespiratory physiotherapy

Opinions regarding the main factors for not pursuing a career in CRP were “having greater interest in another area of physiotherapy” (n=61; 46%), “few job opportunities in the region” (n=47; 35%) and “never having had a placement in CRP during the

physiotherapy programme" (n=11; 8%). When asked if anything could influence them to choose specialising in CRP, most students answered negatively (n= 154; 85%).

General questions and suggestions on CRP

All students (n=189) were asked to rate how certain factors had influenced their opinion of CRP. Lecturers (n=112; 69 %), clinical experience (n=110; 68%), scientific evidence (n=93; 57%) and clinical supervision (n=77; 48%) had the most positive influence on their opinions of CRP.

Undertaking postgraduate studies in physiotherapy was being considered by 68 students (36%), while the majority were still undecided (n= 108; 57%) and 13 (7%) showed no interest in following postgraduate studies. Of the 68 students, 39 specified their intended area of specialization: musculoskeletal (n=13; 33%), neurology (n=12; 31%), sports (n=8; 21%), paediatrics (n=5; 13%), osteopathy (n=5; 13%), geriatrics (n=4, 10%), cardiorespiratory (n=3; 8%), community (n=1; 3%), hydrotherapy (n=1; 3%) and women's health (n=1; 3%).

Students were asked to give suggestions regarding changes in the physiotherapy curriculum to improve the appeal for CRP, i.e., organisation of the clinical exposure/experience, style and organisation of the curriculum of the course and preparation of the clinical educators/lecturers and a content analysis of the 128 responses was conducted. To facilitate the readers' understanding of these suggestions a brief description of the physiotherapy curriculum is provided. In Portugal, the undergraduate physiotherapy degree has four years. Although there is a wide variety across the different institutions, the most common organisation/structure is to have

basic sciences (anatomy, physiology), human movement and introduction to physiotherapy (where some of the basis of physiotherapy are taught) during the first year, and musculoskeletal and neurological physiotherapy in the second year. Third year revisits aspects of the musculoskeletal area and approaches cardiorespiratory physiotherapy. Fourth year provides a comprehensive integration of the different areas with complex clinical case management and research projects. Clinical placements occur commonly in the second semester of the second, third and fourth years and students are allocated to a place from a list of clinical placements provided by each institution (which are not commonly organised by physiotherapy areas) or, in some specific cases (e.g., in the final year of the degree), they may be able to independently find themselves a clinical placement. The undergraduate level does not provide any specialisation. Speciality paths (i.e., musculoskeletal, neurologic, respiratory, cardiovascular, sports, paediatrics, geriatrics) are individually chosen at a postgraduate level in academic institutions although they are not currently recognised in the healthcare systems.

Fifty-five (43%) students reported that CRP should become an obligatory area for at least one clinical placement and this exposure should occur during the 2nd or 3rd years of the course and not in the 4th year "…when students have already made up their minds about what area they want to pursue…" [Gil, 22 years]. Students (n=20, 16%) also reported the need for "…more clinical placements for CRP, as a significant proportion of students are still finishing their courses without knowing what CRP really is… but these should be in different contexts, so each student can then decide if they want to work in paediatrics, intensive care, pulmonary rehabilitation etc.…I think that most of us do not know the real potential and importance of this area..." [Anna, 20 years]. Ten students (8%) also reported the need for all institutions to integrate CRP in their curriculum "…there are

still schools which do not have specific CRP units, this should not be allowed if the idea is to increase the interest in the area…" [John 23 years]. Specific suggestions for improvement and to motivate students to pursue the area were given. Increasing the number of practical lectures (n=35; 27%); allowing the contact with real patients during the lectures (n=20; 16%) and conducting final year research projects in the CRP area (n=10; 8%) were reported as being "crucial". Fifteen (12%) students also reported the need to increase the knowledge and preparation of lecturers and supervisors in this field.

Comparisons between genders

Gender groups provided similar responses in all items except for the one concerning the specialisation area. The musculoskeletal was reported as the area of most interest to specialise by both genders although male students showed greater interest than females ($p<0.001$). Female students also showed a positive interest for geriatrics ($p=0.001$), CRP ($p=0.005$) and neurology ($p=0.007$) or a similar interest (positive or negative) by paediatrics ($p=0.001$) and community ($p=0.013$); while males showed a negative interest by all areas, except by neurology and community, where the demonstrated interest was similar.

<u>Physiotherapists</u>

Physiotherapists working in the cardiorespiratory area

Physiotherapists working in CRP (n=55; 15%) considered that their mentors/role models (n=38; 69%) and interest in CRP (n=45; 82%) were the personal factors that most

influenced in their decision to pursue a career in CRP. Forty-nine (89%) physiotherapists reported that having knowledge of CRP practice prior to entering the physiotherapy programme had little or no influence in their decision. Other personal factors influencing their career choice were personal preferences (n=7; 58%), family issues (n=2; 17%), residence location, good relationship with patients or with fellow practitioners (n=3; 25%). The professional factors most influencing physiotherapists' choice to pursue a career in CRP were the "opportunity to work with patients in an acute setting" (n=35; 64%), "interprofessional practice" (n=31; 56%) and "job availability" (n=30; 55%). Flexible employment was the professional factor that most little or no influence had in their decision (n=50; 91%). Other professional factors reported were job accessibility (n=9; 33%), being a challenging and measurable area (n=9; 33%), being an unexplored area in Portugal (n=6; 22%), and having CRP experience within the undergraduate course (n=3; 11%).

From all previous factors (personal and professional), the three that most contributed to physiotherapists' decision to pursue a career in CRP were: interest in CRP practice (n=37; 67%), opportunity to work with patients in an acute setting (n=31; 56%) and mentorship/role model (n=25; 46%) (Table 2).

Physiotherapists not working in the cardiorespiratory area

Physiotherapists not working in CRP (n=320; 85%) considered that personal and professional factors had little or no influence in their decision in not to pursue a career in CRP. Nevertheless, personal preference for other areas (n=67; 85%) was the personal factor mostly reported however, economic difficulties to further develop knowledge in the area (n=10; 13%) and health problems (n=2; 3%) were also mentioned. Other

professional factors influencing their career choice were the lack of job availability (n=96; 73%), lack of demand by patients (n=27; 21%) and being an area undertaken by other health professionals (n=6; 5%).

From all previous factors, the three that most contributed to physiotherapists' decision not to pursue a career in CRP were: other professional factors (n=177; 58%), lack of postgraduate opportunities (n=140; 46%) and narrow scope (i.e., lack of variation/routine/not-interesting) (n=101; 33%) (Table 2).

(please insert table 2 about here)

General questions and suggestions

Suggestions for improving the interest in CRP focused on raising awareness of the CRP role to increase job vacancies (n=35; 55%): "… very few people know what a physiotherapist is and even less know that a CRP exist and what we can do for them… therefore, there are no jobs and if people don't know about us, even if they need us, how can they give us a job?..." [Sara, 44 years]. Fifteen (23%) physiotherapists reported the need to improve the availability of postgraduate courses in CRP "…there are postgraduate courses in almost all physiotherapy areas, and very little offer and even less of high quality on the CRP area…" [Richard 37 years]. Eight (13%) physiotherapists also mentioned the need to dedicate more time (hours) to the CRP area and using "case-based approach" during students' education and training to improve their clinical reasoning, knowledge and skills.

Comparisons between gender and urban/non-urban areas

Gender differences were only found for the area of preference (p=0.007) and area of work (p=0.047). Although, male and female preferred and were working mostly in the musculoskeletal area, females' responses were more evenly spread over all physiotherapy areas.

Physiotherapists working in urban areas (n=285, 76%) were more experienced (mean 9.8 years vs. 5.7 years, p<0.001), had more postgraduate training (n=172, 60% urban vs. n=38, 42% non-urban, p=0.002) and were more involved in teaching and research (n=19, 7% vs 1, 1%, for teaching and n=10, 3.5% vs none for research, p=0.003) than those working in non-urban areas (n=90, 24%). Only 8% of the professionals working in non-urban areas worked in CRP against 17% in urban areas (p=0.031). No other significant differences were found.

<u>Comparisons between physiotherapists and students</u>

Influence of prior knowledge in the decision to pursue or not a career in CRP

Most students (n=120, 66%) reported having no knowledge about CRP prior to commencing the physiotherapy undergraduate programme. Additionally, 148 (78%) students stated not knowing which area they would like to work in after graduating and 76 (40%) students reported a change in their choice during their physiotherapy training. According to the physiotherapists working (n=49; 89%) and not working (n=259; 81%) in

CRP, having prior knowledge about CRP had little or no influence in their decision to work or not in CRP.

Areas of specialisation

Students were extremely interested in specialising in the musculoskeletal (n=59, 33%) and neurology (n=40; 22%) areas however, the CRP area was the second least preferred [23 (13%) students reported being extremely interested and 32 (18%) showed no interest]. Physiotherapists followed the same interests as students, referring the musculoskeletal area as the one they mostly identified themselves with (n=145, 39%) and the one in which they developed most of their work (n=153; 41%). However, CRP (n=83; 22% and n=59; 16%) moved up in the preference list appearing ahead of neurology (n=55; 15% and n=52; 14%) in both questions.

Influence of factors in the decision to pursue or not a career in CRP

Regarding the factors influencing the choice of a career in CRP, students (n=110; 80%) and physiotherapists (n=45; 82%), mostly assigned a positive influence to the "interesting aspects of the area". "Job accessibility" was rated with a moderate positive influence by both students (n=56, 41%) and physiotherapists (n=30; 55%). "Influence of others", in particular of "teachers and mentors", was reported to have a positive influence on physiotherapists (n=38; 69%), however, students reported much less positive influence (n=29; 21%) and mostly considered no influence of others on their choice (n=97; 71%). When asked directly about having been influenced by a role model/mentor on their decision, 73 (54%) students answered "Yes".

DISCUSSION

This study showed that 13% of physiotherapy students were “extremely interested” in specialising in CRP and only 34% knew the CRP area before commencing their course. Having interest in the area and clinical exposures/experiences were the main positive factors influencing students to pursue a career in CRP, whilst having interest in another area, few job opportunities and lack of clinical exposure were the factors that most negatively influenced students. Our findings also showed that only 15% of the participating physiotherapists were working in the CRP area. Their decision to pursue a CRP career was most influenced by their own interest in the area; the opportunity to work with patients in an acute respiratory setting and having role models/educators. The factors that most contributed not to pursue a CRP career by most physiotherapists were other professional factors (e.g., lack of job availability and lack of demand by patients), lack of postgraduate opportunities and narrow scope of practice. Musculoskeletal was the preferred physiotherapy area by males and females in students and professionals however, females showed a more equally distributed interest by the different physiotherapy areas. Physiotherapists working in urban areas were more experienced, had more postgraduate training and a higher CRP caseload than those working in non-urban areas.

Similarly to our study, previous research reported that 26 to 32% students knew about CRP before commencing their course (Janaudis-Ferreira et al., 2016; Reeve, Skinner, Lee, Wilson, & Alison, 2012) and only 0.5 to 12.5% were extremely interested in specialising in CRP (Janaudis-Ferreira et al., 2016; Öhman, Stenlund, & Lars, 2001; Reeve, Skinner, Lee, Wilson, & Alison, 2012; Roskell & Cross, 2003), even after having had a positive

contact/experience with the area during the course. This is already being reflected in the small number of physiotherapists working in CRP as shown in our results.

Although there are no studies in this field, it is believed that the lack of knowledge and interest in CRP may be related to the history and development of the physiotherapy profession. Physiotherapy emerged, in the 19th century, closely linked to natural remedies and simple physical agents needed for musculoskeletal rehabilitation during world wars and poliomyelitis epidemic (Klinteberg, 1992). For these reasons, physiotherapy core of practice has been associated to musculoskeletal injuries. Currently, with the increasing life expectancy, aging and lifestyle-related diseases, the initial therapeutic concept has expanded to cover a wide range of physiotherapy specialities, in which CRP is included since 1978 (Swisher, Sciaky, Campbell, & Lowman, 2008). Nevertheless, musculoskeletal continues to be the most well-known area of the physiotherapy practice. In recent reports, medical respondents have shown awareness of physiotherapy benefits in the management of musculoskeletal disorders (Chioma, 2007; Holdsworth, Webster, McFadyen, & Scottish Physiotherapy Self Referral Study Group, 2008) however, the benefits of physiotherapy in cardiorespiratory disorders or in any other disorders were never mentioned. Similarly, a survey inquiring patients' knowledge and attitudes towards physiotherapy has shown that 60 to 70% of respondents had limited knowledge of physiotherapy in general and of its different areas (Webster, Holdsworth, McFadyen, Little, & Scottish Physiotherapy Self Referral Study Group, 2008). Even among physiotherapy students (Öhman, Solomon, & Finch, 2002; Öhman, Stenlund, & Lars, 2001) and professionals (Bergman, 1989; Johansson, 1999), males or females, the main interest has focused on musculoskeletal and sports areas however, in the future, the intervention needs will be in broaden areas as the

worldwide population is aging (Öhman, Stenlund, & Lars, 2001). Thus, there is a need to raise academic and public awareness about physiotherapy and its different areas of action. A special emphasis should also be given to increase awareness and interest of physiotherapy students for the CRP area, given the major health, economic and social burden of the NCD worldwide (World Health Organization, 2017), and the ideal skills of these professionals to manage lifestyle-related conditions.

Patient education and exercise training are hallmarks of physiotherapy practice and these interventions are effective in preventing, managing and, in some cases, reversing lifestyle-related conditions (Dean, 2009a, 2009b; Dean et al., 2014). Nevertheless, assessment and intervention strategies directed to these conditions in CRP practice and curriculums are minimal not just in Portugal, but also around the world (Dean et al., 2011; Dean et al., 2014; Roskell, 2013). As shown by our data and by similar findings previously reported (Hussey et al., 2017; Reeve, Skinner, Lee, Wilson, & Alison, 2012), approximately 25% of students have never had a CRP clinical placement, there are still physiotherapy curriculums where CRP modules are absent and there is a misconception of the narrow scope of this area. But the fact is that a paradigm shift has occurred in the modern society, and the cardiorespiratory area has nowadays a much broader scope of action that most people have not yet recognised. Cardiorespiratory is no longer just about assessing and treating acute cardiorespiratory conditions, it is also about the assessment and treatment of lifestyle-related conditions (Reeve, Skinner, Lee, Wilson, & Alison, 2012; Roskell, 2013). CRP now includes treating respiratory or cardiovascular patients in acute, primary and tertiary contexts and it involves exercise interventions and education, advice and health promotion (Reeve, Skinner, Lee, Wilson, & Alison, 2012). Therefore, there is a need to reflect this scope of action in the physiotherapy

curricula and to integrate interprofessional collaborative education and practice opportunities in both undergraduate and graduate programmes (Lindqvist, Duncan, Rout, Watts, & Pearce, 2005; Morgan, 2017).

In fact, more than half of the time of physiotherapists' clinical practice is now spent on interprofessional activities (Hylin, Nyholm, Mattiasson, & Ponzer, 2007), which in this study was felt as one of the main professional factors influencing physiotherapists to pursue a career in CRP. It is well established that health promotion and management of chronic conditions depends on an effective collaborative interprofessional practice. Nevertheless, the current protectionism around professions promotes more isolation, elitism, and territorialism than creates and protects professional identity. Thus, attending to CRP current scope of action and to the motivation of physiotherapists to pursue a CRP career, seem essential to promote interprofessional activities from graduation onwards. Within this context, there is a need to alter the perceptions of physiotherapy students and physiotherapists, as well as the curriculum from curative orientation towards a curriculum that addresses health promotion functions and psychosocial aspects of healthcare delivery (Nolte & McKee, 2008; Roskell, 2013). This comprehensive curriculum will reduce the role of profession-centrism (Pecukonis, 2014), increase health professionals' understanding about each other's work, and decrease the feelings of fear and anxiety about their role being taken by others (McNeil, Mitchell, & Parker, 2013), thus enhancing professional practice and enriching professional identity. Ultimately, these changes will help to develop an adequate workforce that will contribute to improve the quality of life and well-being of patients and families, but also to enhance professional practice (Morgan, 2017), professional

identity and acceptance of others through collaborative practice in modern times (World Health Organization, 2010).

Similarly to previous studies, clinical exposure was considered as an important factor influencing students to specialise in CRP (Hussey et al., 2017; Janaudis-Ferreira et al., 2016; Reeve, Skinner, Lee, Wilson, & Alison, 2012). It has been shown that students feel less confident in CRP when compared to other specialities (Roskell & Cross, 2003), simply because they are not often exposed to the area. It has been called the "theory-practice gap", which reduces the effectiveness of the learning environment and the attractiveness of a specialty (Roskell & Cross, 2003). In fact, a study of physiotherapists' education (Hunt, Adamson, & Harris, 1998; World Health Organization, 2017) reported that students lacked knowledge of the 'world of work', indicating that clinical practice represents a powerful element within the 'hidden curriculum' of professional socialisation with confidence (Roskell & Cross, 2003). This idea was also corroborated by physiotherapists, who reported that one of the most influencing factors to pursue a career in CRP was their clinical role models and educators. In the context of health care, role models and educators are mentors that serve as a valuable resource to bridge the gap between theory and practice (Lafleur & White, 2010). The literature contains little guiding evidence to determine the most appropriate method of mentor–mentee interactions (Yoon et al., 2017). This suggests that there is not a "one-size-fits-all" approach to mentorship relationships and that outcomes may be optimised by using an individualised approach to the interaction (Yoon et al., 2017). This relationship should be further valued as it is known that mentoring affects career productivity, satisfaction (Sambunjak, Straus, & Marusic, 2010), perception of confidence and is one of the most important features for the development of expertise among physiotherapists

(Sambunjak, Straus, & Marusic, 2010; Shepard, Hack, Gwyer, & Jensen, 1999). Therefore, our findings emphasise the need of those involved in higher education and clinical practice to provide opportunities for better integration with the clinical practice in this specialty in order to lessen the gap between theory and practice, realising their vital role in encouraging students to pursue careers in CRP and contributing for the future of CRP worldwide.

Home care, geriatric or community care were the least popular areas for specialisation, as previously reported (Janaudis-Ferreira et al., 2016; Öhman, Solomon, & Finch, 2002; Reeve, Skinner, Lee, Wilson, & Alison, 2012). In this line, a small percentage of physiotherapists identified themselves with or were working in these areas. However, healthcare policies advocate shifting health care from hospitalised settings into the community or home (Nolte & McKee, 2008). This is likely to increase the demand of physiotherapists and hence job opportunities in these areas. Nevertheless, as demonstrated by our findings, to consider these areas as viable career options, students need to be exposed to positive educators, clinical role models and evidence-based knowledge, acquire a broader understanding of healthcare issues, become familiar with community-based care and be prepared to work in these settings (Nolte & McKee, 2008). This exposure must also include rural areas, since residents of rural communities tend to experience poorer health outcomes and exhibit higher health needs. Therefore, workforce shortages and maldistribution mean that rural communities do not have access to the range of services available in urban areas (Adams, Jones, Lefmann, & Sheppard, 2015), but it also means they are an area of opportunity for physiotherapists to expand their range of action.

Strategies suggested to increase the profile of CRP were similar to those previously reported and consisted of i) including modules and at least one specific clinical placement in CRP within the physiotherapy curriculum (Hussey et al., 2017; Reeve, Skinner, Lee, Wilson, & Alison, 2012); ii) adjusting physiotherapy curricula to emphasise health promotion and management of lifestyle risk factors (Dean et al., 2014); iii) creating opportunities to develop CRP skills in broaden contexts (such as primary/community/home care) and settings (rural vs urban areas), and implementing these skills in different health conditions (Dean et al., 2014; Hussey et al., 2017; Nolte & McKee, 2008; Reeve, Skinner, Lee, Wilson, & Alison, 2012) and lastly iv) developing health promotion activities to the community, health professionals and students to increase awareness about the role of CRP on the management of lifestyle conditions and clarify misconceptions (Janaudis-Ferreira et al., 2016; Reeve, Skinner, Lee, Wilson, & Alison, 2012). Moreover, our findings also suggest that the development of advanced training within the CRP may enhance the attractiveness of the area (Pitta et al., 2014; Roskell & Cross, 2003).

Limitations of the study

The surveys were disseminated via the contacts of the institutions offering an undergraduate physiotherapy programme and the national physiotherapy association, thus it cannot be guaranteed that all final year students and physiotherapists have received the links. However, people were also encouraged to share the links among their contacts to minimise any potential bias of this disseminating method and reminders were sent to minimise the lack of response. Additionally, the voluntary nature of

participation in an online survey might have influenced results as it is likely that participants already had some opinion about CRP.

Another potential limitation is that the work regime was not questioned and therefore, answers of full-time and part-time physiotherapists could not be differentiated. Different results might have been found if this comparison was conducted and therefore, questioning about work regime should be considered in future studies. Moreover, in this study, interest to pursue or not a career in CRP and personal and professional factors were explored however, participants were not specifically asked about their personal preferences (e.g., fast pace, ability to apply physiology to treatments). In future studies, personal preferences could be explored, namely in qualitative studies so that a more in depth understanding of the participants' reasons to pursue or not a career in CRP can be obtained. There were also two different questionnaires being used to facilitate comparisons with other international studies however, this hindered comparisons between students and physiotherapists. In the future, studies using the same or matching questionnaires would be important to obtain a more comprehensive analysis of both samples. Finally, in the case of students, all institutions providing physiotherapy training were located in urban areas, therefore, it remains unknown whether students trained in non-urban areas would provide different responses. In future studies, including this data may enhance our understanding of the CRP education and practice.

CONCLUSION

This study has showed that a small percentage of the physiotherapy students and physiotherapists identified CRP as an area of present or future practice. Given the major health, economic and social burden of the NCD worldwide and the ideal skills of CRP to manage lifestyle-related conditions it seems important to change students' and physiotherapists' perspectives about CRP. Strategies focusing on changing the physiotherapy curriculum structure and focus, increasing students' exposure to CRP practice in different contexts, settings and conditions, providing good mentorship models, developing health promotion activities directed to the community, health professionals and students and creating high quality postgraduate courses may increase the attractiveness for CRP.

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DECLARATION OF INTEREST

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PREVIOUS PRESENTATIONS

Part of this work has been presented as a poster by Doctor Alda Marques at the European Respiratory Society Annual Congress 2016 (London, 6 September, 2016).

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Tables captions

Table 1. General characteristics of the physiotherapy students (n=189) and the physiotherapists (n=375).

Table 1. General characteristics of physiotherapy students (n=189) and physiotherapists (n=375).

Characteristics	**Physiotherapy students (n=189)**	**Physiotherapists (n=375)**
Age, years [mean (SD)]	23.3 (5.8)	31.4 (8.3)
Sex		
Female	147 (77.8%)	292 (77.9%)
Male	42 (22.2%)	83 (22.1%)
Degree		
Undergraduate		290 (77.3%)
MSc		76 (20.3%)
PhD		9 (2.4%)
Course or postgraduate course in CRP		
Yes		204 (54.4%)
No		171 (45.6%)
Centre of practice (No of habitants)		
< 1,000 (rural centre)		14 (3.7%)
≥ 2,000 and < 5,000 (semi-urban centre)		76 (20.3%)
≥ 5,000 (urban centre)		285 (76.0%)
Area of practice that best describe the majority of professionals caseload in the last 2 years		
Musculoskeletal		153 (40.8%)
Generic		80 (21.3%)
Cardiorespiratory		80 (21.3%)
Neurologic		52 (13.9%)
Other (geriatric, pediatric, hydrotherapy and women's health)		35 (9.3%)

Area that professionals identify with most		1
Musculoskeletal	145 (38.6%)	2
Cardiorespiratory	83 (22.1%)	3
Neurologic	59 (15.7%)	
Generic	51 (13.6%)	4
Other (women's health, pediatrics, geriatrics)	37 (9.9%)	5

6 Data are presented as number(percentage), unless otherwise stated.

7 Legend: CRP, cardiorespiratory physiotherapy; MSc, masters' degree; PhD, doctorate degree.

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Table 2. Influential factors to pursue (n=55) or not (n=305) a cardiorespiratory physiotherapy career.

Table 2. Influential factors to pursue (n=55) or not (n=305) a cardiorespiratory physiotherapy career.

Three most influential factors contributing to physiotherapists' decision to pursue a career in CRP (n=55)		**Three most influential factors contributing to physiotherapists' decision not to pursue a career in CRP (n=305)**	
Interest in CRP practice	37 (67.3%)	Other professional factors	177 (58.0%)
Opportunity to work with patients in an acute setting	31 (56.4%)	Lack of postgraduate opportunities	140 (45.9%)
Mentorship/Role mode	25 (45.5%)	Narrow scope: Lack of variation/routine/not-interesting	101 (33.1%)
Job availability	22 (40.0%)	Lack of opportunity for advancement	96 (31.5%)
Other professional factors	18 (32.7%)	Other personal factors	85 (27.9%)
Inter-professional practice	15 (27.3%)	Lack of knowledge regarding scope of CRP practice	81 (26.6%)
Previous Knowledge of CRP practice prior to entering the physiotherapy program	8 (14.5%)	Lack of control of caseload management	68 (22.3%)
Access to physical resources (e.g., diagnostics)	5 (9.1%)	Perceived competence in CRP settings	67 (22.0%)
Other personal factors	4 (7.3%)	Possibility of working weekend shifts	45 (14.8%)
		Attitudes of peers regarding CRP	34 (11.1%)
		Negative clinical experiences	22 (7.2%)

Data is presented as number (percentage).

Legend: CRP, cardiorespiratory physiotherapy.

Figure legends

Figure 1. Responses regarding career intentions in physiotherapy students.

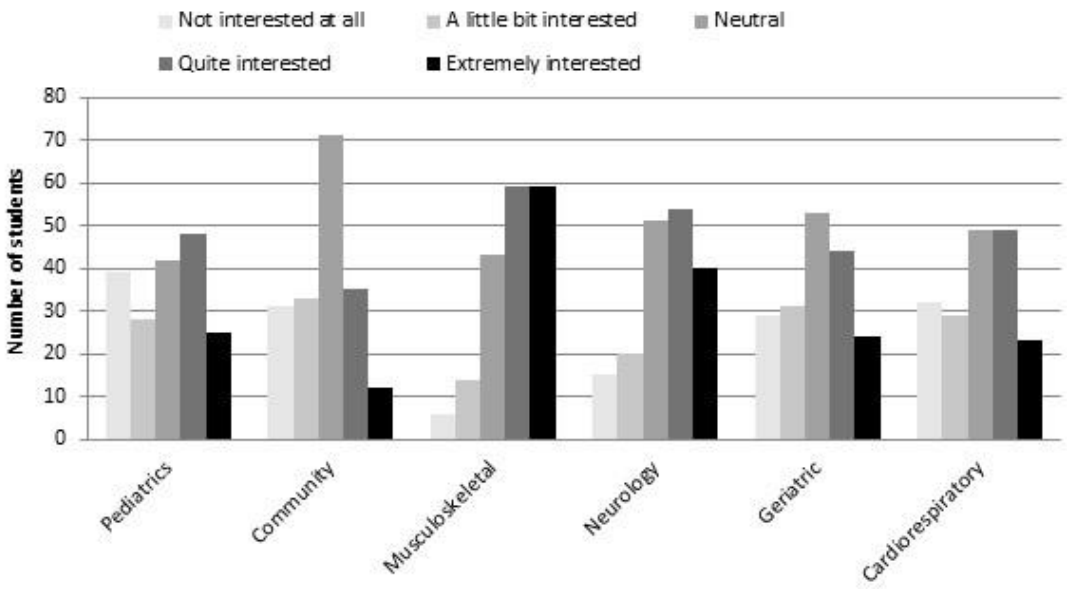

Figure 2. Responses regarding influential factors in students' choice of their future specialisation area.

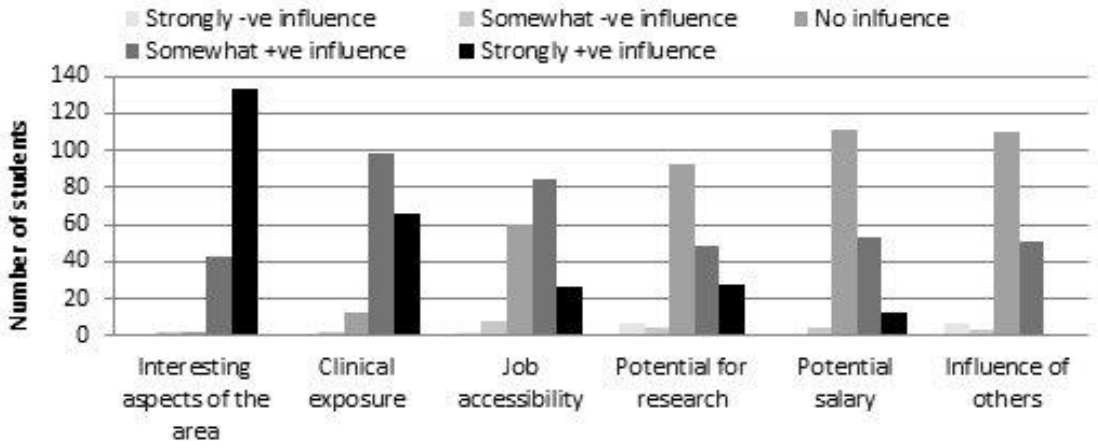

Figure 3. Responses regarding influential factors in students' decisions to consider specialising in cardiorespiratory physiotherapy.

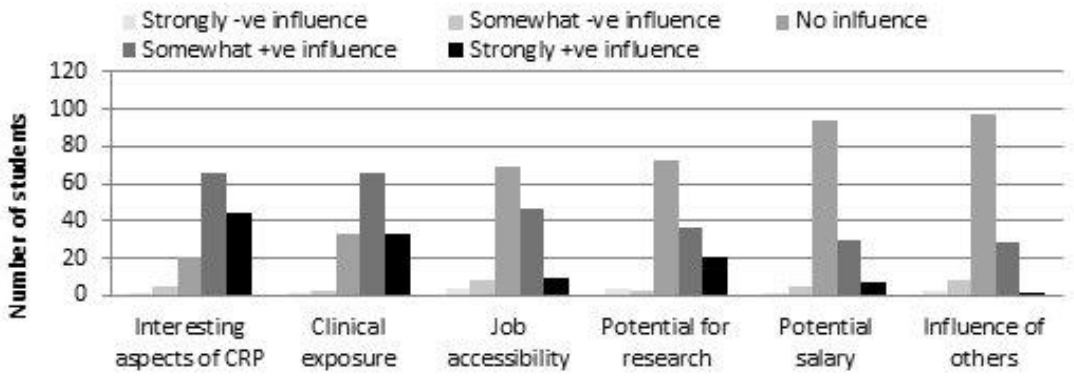

Figure 4. Students' choice of preferred setting to work in cardiorespiratory physiotherapy.